

**REMARKS**

In the Office Action dated August 9, 2006, the Examiner rejected claim 11 under 35 U.S.C. §102(e) as allegedly being anticipated by U.S. Patent Application Publication No. 2002/0159513 (hereinafter "WILLIAMS") and rejected claims 39, 41-46 and 48-57 under 35 U.S.C. §103(a) as allegedly being unpatentable over WILLIAMS in view of U.S. Patent No. 6,643,295 (hereinafter "NOSE"). Reconsideration of the outstanding rejection of pending claims 11, 39, 41-46 and 48-52 is respectfully requested in view of the following remarks.

In paragraph 3, the Office Action rejects claim 11 under 35 U.S.C. §102(e) as allegedly being anticipated by WILLIAMS. Applicant respectfully traverses.

Independent claim 11 recites a "method of scheduling cable modems in a broadband communications system" that includes "receiving bandwidth allocation requests from the cable modems," "for each of the bandwidth allocation requests, determining a mini-slot size based on a modulation and symbol rate associated with a respective bandwidth allocation request," "scheduling transmission on a physical upstream channel from cable modems associated with each of the bandwidth allocation requests based on a respective mini-slot," "segregating the physical upstream channel into multiple virtual upstream channels, wherein each of the multiple virtual upstream channels is associated with a different modulation and symbol rate," "grouping the cable modems into a plurality of groups" and "assigning a different one of the multiple virtual upstream channels to each of the plurality of groups for upstream transmission."

A proper rejection under 35 U.S.C. § 102 requires that a reference teach every aspect of the claimed invention. See M.P.E.P. § 2131. WILLIAMS does not disclose or suggest the

combination of features recited in claim 11. For example, WILLIAMS does not disclose or suggest, among other features, “determining a mini-slot size based on a modulation and symbol rate associated with a respective bandwidth allocation request” or “segregating the physical upstream channel into virtual upstream channels, wherein each of the multiple virtual upstream channels is associated with a different modulation and symbol rate,” as recited in claim 11. In rejecting claim 11, the Office Action (pgs. 2-3) relies on paragraph [0035], lines 22-23 and 34-35 of paragraph [0038], elements 802 and 806 of FIG. 8, and elements 110 and 112 of FIG. 1 for allegedly disclosing the features of claim 11. Applicant submits that these sections of WILLIAMS do not disclose or suggest the features of claim 11 as alleged by the Office Action.

At paragraph [0035], WILLIAMS discloses:

FIG. 5 depicts upstream data transmission in timeslots 502-512. The CMTS upstream channel is configured as a 6.4 MHz channel. At timeslot 502, a single modem transmits at the maximum channel data rate of 6.4 MHz. At timeslot 504, two modems each transmit in a separate 3.2 MHz band. Each 3.2 MHz band is a sub-channel. The term sub-channel refers to a portion of the CMTS upstream channel, wherein a plurality of sub-channels may occupy the channel. As shall be further described, sub-channels may be of different bandwidth, may employ different center frequencies, and may employ same or different encoding formats. The transmission depicted at timeslot 504 may also be representative of a single modem transmitting in two 3.2 MHz sub-channels, allowing the modem to achieve a 6.4 MHz transfer rate while maintaining a DOCSIS compatible symbol rate of 2.56 million symbols per second. As shown in FIG. 5, a plurality of modems can transmit simultaneously within a single upstream channel. At timeslot 506 of FIG. 5, four modems, each with a 1.6 MHz bandwidth, occupy the 6.4 MHz bandwidth upstream channel. The bandwidth of the modems in a channel need not be the same, as illustrated in timeslot 510 and timeslot 512. Advantageously, the present invention allows the full bandwidth of a channel to be utilized by multiple modems that do not have to operate at the same frequency or bandwidth.

This paragraph of WILLIAMS discloses the use of sub-channels, in an upstream channel, where each sub-channel may have a different bandwidth, may employ different center frequencies and may also employ different encoding formats. This paragraph of WILLIAMS does not disclose, or in anyway suggest, anything relating to modulation on the upstream channel. This paragraph of WILLIAMS, therefore, does not disclose or suggest “determining a mini-slot size *based on a modulation and symbol rate* associated with a respective bandwidth allocation request” or “segregating the physical upstream channel into virtual upstream channels, wherein each of the multiple virtual upstream channels is *associated with a different modulation and symbol rate*,” as recited in claim 11.

At lines 22-23 and 34-35 of paragraph [0038], WILLIAMS discloses:

At step 806, the available bandwidth may be determined. Such determination may include bandwidth associated with sub-channels and timeslots previously assigned.

At step 810, timeslots associated with each sub-channel may be assigned. In the above-described manner, the method of the present invention may be employed to dynamically (i.e. in a flexible, responsive, and programmable manner) assign sub-channels and timeslots in consideration of available bandwidth and the number and nature of modem requests.

These sections of paragraph [0038] of WILLIAMS disclose the determination of an available bandwidth for transmission and the assignment of sub-channels and timeslots within the available bandwidth. These sections of paragraph [0038] of WILLIAMS, however, do not disclose, or in anyway suggest, anything regarding modulation on the upstream channel. These sections of paragraph [0038] of WILLIAMS, therefore, do not disclose or suggest “determining a mini-slot size *based on a modulation and symbol rate* associated with a respective bandwidth allocation request” or “segregating the physical upstream channel into

virtual upstream channels, wherein each of the multiple virtual upstream channels is *associated with a different modulation and symbol rate*,” as recited in claim 11.

Elements 802 and 806 of FIG. 8 of WILLIAMS disclose the receipt of modem requests (element 802 of FIG. 8) and the determination of available bandwidth (element 806 of FIG. 8). Elements 110 and 112 of FIG. 1 of WILLIAMS merely disclose two different nodes 110 and 112 connected to a hub 106. None of the elements of FIGS. 1 and 8 of WILLIAMS disclose, or in any way suggest, “determining a mini-slot size *based on a modulation and symbol rate* associated with a respective bandwidth allocation request” or “segregating the physical upstream channel into virtual upstream channels, wherein each of the multiple virtual upstream channels is *associated with a different modulation and symbol rate*,” as recited in claim 11.

Since WILLIAMS does not disclose each and every feature of claim 11, WILLIAMS cannot anticipate claim 11. Withdrawal of the rejection of claim 11 under 35 U.S.C. §102(e) is, therefore, respectfully requested.

In paragraph 5, the Office Action rejects claims 39, 41-46 and 48-57 under 35 U.S.C. §103(a) as allegedly being unpatentable over WILLIAMS in view of NOSE. Applicant respectfully traverses and submits that the Office Action has failed to establish a *prima facie* case of obviousness.

Independent claim 39 recites a method that includes “grouping cable modems into a plurality of groups, wherein the cable modems are grouped into the plurality of groups based on a latency associated with each of the plurality of groups” and “assigning a different virtual upstream channel to each of the plurality of groups, wherein each virtual upstream channel is

associated with a different modulation, symbol rate or preamble."

As one requirement for establishing a *prima facie* case of obviousness, the reference (or references when combined) cited by the Office Action must teach or suggest all of the claim features. *In re Vaeck*, 947 F.2d 488, U.S.P.Q.2d 1438 (Fed. Cir. 1991). See M.P.E.P. § 2143. Applicant respectfully submits that WILLIAMS and NOSE, whether taken alone or in any reasonable combination, do not teach or suggest each and every feature of claim 39.

For example, WILLIAMS and NOSE do not disclose or suggest "grouping cable modems into a plurality of groups, wherein the cable modems are grouped into the plurality of groups based on a latency associated with each of the plurality of groups," as recited in claim 39. In rejecting claim 39, the Office Action (pg. 3) admits that WILLIAMS fails to disclose that "cable modems are grouped based on a latency associated with each of the plurality of groups." The Office Action (pg. 4), however, cites to column 4, lines 55-57 of NOSE for allegedly disclosing "measuring a transmission delay between the central control unit (CMTS) and each terminal (cable modem)." Applicant submits that the section of NOSE cited by the Office Action does not disclose or suggest separating "cable modems into groups based on a delay between the CMTS and the cable modem," as alleged by the Office Action.

At column 4, lines 55-57, NOSE discloses:

The transmission delay measurer 15 measures every transmission delay between the central control unit 1 and a terminal in operation. The transmission delay measurer 15 calculates a time required to make a round trip, namely, a transmission delay using the timer and forwards the transmission delay to the MAC 11.

This section of NOSE merely discloses the measurement of a transmission delay between a control unit 1 and a terminal. In column 2, lines 21-25, NOSE further discloses:

The determining means determines the maximum transmission delay out of the transmission delays. The controlling means controls the timing of the data transmission in the system on the basis of the maximum transmission delay.

As is apparent from column 2, lines 21-25, NOSE discloses that a maximum transmission delay of the measured transmission delays between the control unit 1 and terminals is used only to control the timing of data transmission in the system. NOSE does not disclose, or even suggest, that the transmission delay measurements are used for *grouping cable modems into multiple groups based on a latency associated with each of the multiple groups*. Thus, WILLIAMS and NOSE, either singly or in combination, do not suggest or disclose “grouping cable modems into a plurality of groups, wherein the cable modems are grouped into the plurality of groups based on a latency associated with each of the plurality of groups,” as recited in claim 39. Since WILLIAMS and NOSE do not disclose or suggest each and every feature of claim 39, the Office Action has failed to establish a *prima facie* case of obvious for at least this reason.

A further requirement for establishing a *prima facie* case of obviousness is that there must be some reason, suggestion, or motivation to combine reference teachings.

*In re Vaeck*, 947 F.2d 488, U.S.P.Q.2d 1438 (Fed. Cir. 1991). See M.P.E.P. § 2143. Applicant respectfully submits that the Office Action has not provided a sufficient reason, suggestion, or motivation for combining the alleged disclosure of NOSE with the disclosure of WILLIAMS.

In rejecting claim 39, the Office Action (pg. 4) alleges that “[i]t would have been obvious to one having ordinary skill in the art at the time the invention was made

to modify the cable system of Williams to separate cable modems into groups based on a delay between the CMTS and the cable modem, as suggested by Nose, *so that transmission power levels would be adjusted to accommodate geographically located cable modems*" (emphasis added). As already discussed above, NOSE merely discloses that a maximum transmission delay of the measured transmission delays between a control unit and terminals is used to control the timing of data transmission in the system. Neither NOSE nor WILLIAMS discloses or suggests separating cable modems into groups based on measured transmission delays "so that transmission power levels would be adjusted to accommodate geographically located cable modems," as alleged by the Office Action. This alleged motivation for modifying the disclosure of WILLIAMS is not anywhere disclosed or suggested in either NOSE or WILLIAMS. Applicant, therefore, submits that the Office Action's motivation to combine the disclosure of NOSE with the disclosure of WILLIAMS results from impermissible hindsight derived from Applicant's own disclosure. Since the Office Action has not provided a sufficient reason, suggestion or motivation for combining NOSE with WILLIAMS, the Office Action has failed to establish a *prima facie* case of obviousness for at least this additional reason.

Since the Office Action has failed to establish a *prima facie* case of obviousness for the above-noted reasons, withdrawal of the rejection of claim 39 is respectfully requested.

Claims 41-45 depend from claim 39. Withdrawal of the rejection of these claims is requested for at least the reasons set forth above with respect to claim 39.

These claims include additional features not disclosed or suggested by the references cited by the Office Action.

For example, claim 41 recites the features “differentiating slower cable modems from faster cable modems” and “assigning bandwidth to the cable modems based on the differentiation such that the slower cable modems are allowed to transmit data proportionately more frequently than faster cable modems” that are not disclosed or suggested by NOSE or WILLIAMS. In rejecting claim 41, the Office Action (pg. 4) admits that WILLIAMS does not disclose the above-noted features of claim 41. The Office Action, however, alleges that “[i]t would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the cable system of WILLIAMS to assign more frequently unused bandwidth of a given upstream channel to a modem operating at slower data rate such that the bandwidth would not be wasted.” Since the Office Action admits that WILLIAMS does not disclose the features of claim 41, and does not cite to any portions of NOSE as allegedly disclosing these features, the Office Action, therefore, appears to be taking “Official Notice” that the features of claim 41 are well known in the art. See M.P.E.P. § 2144.03. Applicant respectfully traverses this “Official Notice” and submits that the above-noted features represent Applicant’s own novel solution for bandwidth assignment to slower and faster cable modems, and would not be considered to be “common knowledge” or “well-known in the art” as the Office Action appears to be alleging. In accordance with M.P.E.P. § 2144.03, Applicant requests that the Examiner cite a reference that

supports the alleged obviousness of the features of claim 41. Absence such a citation, Applicant requests that the rejection of claim 41 be withdrawn.

Independent claim 46 recites similar features to (though possibly having different scope than) the features of claim 39. Withdrawal of the rejection of claim 46 is, therefore, requested for similar reasons to those set forth above with respect to claim 39.

Claims 48-52 depend from claim 46. Withdrawal of the rejection of these claims is requested for at least the reasons set forth above with respect to claim 46. Additionally, claim 48 recites similar features to those discussed above with respect to claim 41. Withdrawal of the rejection of claim 48 is additionally requested for similar reasons to those set forth above with respect to claim 41.

Independent claim 53 recites a method that includes "grouping cable modems into different groups based on latencies associated with the cable modems" and "allocating bandwidth request opportunities to each of the different groups of cable modems based on the different latencies associated with each of the groups." The "grouping cable modems into different groups based on latencies associated with the cable modems" feature of claim 53 is similar to (though possibly having different scope than) the feature of claim 39 discussed above with respect to the rejection of claim 39. For similar reasons to those set forth above with respect to claim 39, Applicant respectfully submits that WILLIAMS and NOSE do not disclose this feature of claim 53. Also, for similar reasons to those set forth above with respect to claim 39, Applicant submits that the Office Action has not provided a sufficient

reason, suggestion or motivation for combining the disclosure of WILLIAMS with the disclosure of NOSE. Applicant additionally submits that WILLIAMS and NOSE do not disclose “allocating bandwidth request opportunities to each of the different groups of cable modems based on the different latencies associated with each of the groups,” as also recited in claim 53, and Applicant notes that the Office Action has failed to even address this feature. If the Examiner persists in maintaining the rejection of claim 53, Applicant requests that any future Office Action specifically address where this feature is disclosed in the cited references. Withdrawal of the rejection of claim 53 is respectfully requested for at least the reasons set forth above.

Claims 54-56 depend from claim 53. Withdrawal of the rejection of these claims is requested for at least the reasons set forth above with respect to claim 53.

Independent claim 57 recites a method that includes “differentiating slower cable modems from faster cable modems in a cable network” and “assigning upstream bandwidth to the cable modems based on the differentiation such that the slower cable modems are allowed to transmit data on the upstream proportionately more frequently than faster cable modems.” The features of claim 57 are similar to (though possibly having different scope than) the features of claim 41 discussed above with respect to the rejection of claim 41. Withdrawal of the rejection of claim 57 is, therefore, requested for similar reasons to those set forth above with respect to claim 41.

In view of the foregoing remarks, Applicant respectfully requests the Examiner's reconsideration of this application, and the timely allowance of the pending claims. If any questions remain, the Examiner is invited to contact the undersigned at the telephone number

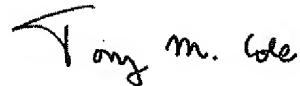
U.S. Patent Application No. 10/032,622  
Attorney's Docket No. 0023-0142

listed below.

To the extent necessary, a petition for an extension of time under 37 CFR § 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account No. 50-1070 and please credit any excess fees to such deposit account.

Respectfully submitted,

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